STANDARDS & REGULATIONS

Standards and regulations affect and motivate the design of power supplies, specifically:

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### EMI - Electromagnetic Interference

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<th>Radiated E-field Emissions (30 MHz to 40 GHz)</th>
<th>Radiated H-field Emissions (9 kHz to 30 MHz)</th>
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<tr>
<td><strong>FCC Part 15</strong></td>
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<td><strong>EN 61000-6-3</strong></td>
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<td><strong>FCC Part 15</strong></td>
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<td><strong>CNS 13438</strong></td>
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### AC Power Line Harmonics

- EN 61000-3-2 / IEC 61000-3-2

### AC Power Line Flicker

- EN 61000-3-3 / IEC 61000-3-3

### Immunity Reference (Standards)

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<tr>
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<th>Electrostatic Discharge</th>
<th>Radiated RF Immunity</th>
<th>Electrical Fast Transient</th>
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<td><strong>EN 61000-4-6 / IEC 61000-4-6</strong></td>
<td><strong>EN 61000-4-8 / IEC 61000-4-8</strong></td>
<td><strong>EN 61000-4-11 / IEC 61000-4-11</strong></td>
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### Other Regulations Regarding Safety and Surge Protection

- IEC61643-1; EN61643-11 and EN61643-21
- Telcordia Technologies
- UL5261

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Bourns products are available through authorized Bourns sales distributors. To locate a distributor in your area, please visit our website for more information.

www.bourns.com

Bourns customer service can be reached at +1 951 781 5500  techweb@bourns.com

Bourns components are manufactured to meet or exceed RoHS 6/3 regulations and the company is committed to the development of lead-free products.
Overview

STANDARDS & REGULATIONS

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Worldwide Sales Offices

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<tr>
<td>Americas</td>
<td>+1-951-781-5500</td>
<td><a href="mailto:americus@bourns.com">americus@bourns.com</a></td>
</tr>
<tr>
<td>Brazil</td>
<td>+55 11 5505 0601</td>
<td><a href="mailto:americus@bourns.com">americus@bourns.com</a></td>
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<tr>
<td>China</td>
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<td><a href="mailto:asiacus@bourns.com">asiacus@bourns.com</a></td>
</tr>
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<td>+36 88 885 877</td>
<td><a href="mailto:eurocus@bourns.com">eurocus@bourns.com</a></td>
</tr>
<tr>
<td>Japan</td>
<td>+81 49 269 3204</td>
<td><a href="mailto:asiacus@bourns.com">asiacus@bourns.com</a></td>
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<tr>
<td>Korea</td>
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<tr>
<td>Singapore</td>
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<tr>
<td>Taiwan</td>
<td>+886 2 25624117</td>
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<tr>
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<td>+886 2 25624117</td>
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Technical Assistance

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<tr>
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Specifications subject to change without notice. Actual performance in specific customer applications may differ due to the influence of other variables. Customers should verify actual device performance in their specific applications.

Worldwide Sales Offices
**DESIGN CYCLE**

**DEFINE REQUIREMENTS**
- Customer
- Application
- Standards & Regulations
- Power & Recitation

**SELECT & DESIGN COMPONENTS**
- Integrated Circuits, Power Conversion, Analog, Power, Signals, Control
- Power Conversion
- Transformers, Couplers, DC/DC
- Coupling
- Circuit Protection
- Diodes, MOSFETs, Thyristors, Gate Bipolar Transistors (GBTs)

**ANALYSIS & SIMULATION**
- Power Supply
- Rectifier Bridge
- EMI Filter
- Opto-Coupler

**TEST & PROTOTYPE**

**REVISE & REDEFINE**

**FINALIZE**

**Bourns® Power Supply Component Guide**

An offline AC/DC Power Supply includes stages such as Power Factor Correction, EMI (Electro Magnetic Interference) filters, an isolation barrier, transformer and non-isolating Switch Mode Power Supplies (SMPS) displaying various SMPS topologies. They convert DC voltages to different levels of DC voltage for specific applications.

With continuing miniaturization and packaging innovation, Bourns® circuit protection, circuit conditioning and protection control products deliver the standards-based solutions OEMs can rely on to meet ongoing technical demands.

---

**SELECT & DESIGN COMPONENTS**

When designing power supplies, engineers decide if custom or off-the-shelf components are necessary.

**OFF-The-Shelf:** When using off-the-shelf components, designers refer to recommended and tested components, for example, AEC-Q compliant for automotive applications, or inductors and transformers recommended by reference designs. Simulation software helps designers to vary product performance in their application. Bourns® components are included in leading simulation tools.

**CUSTOM:** In cases where designers need to optimize performance or have specific needs, for example, resizing MOVs, PTCS, Fuses, GDTs, GMOVs, Diodes, PTCs, Thyristors, TBU® Devices, etc., Bourns engineering teams support every phase of the custom design cycle (specification, parts to be designed). Bourns offers components for both linear power supplies and switch mode power supplies. Bourns’ extensive line of electronic components and custom application solutions meet customer device requirements for high reliability performance in smaller, more compact designs.

**Bourns Design Cycle Capabilities**
- Transformer Prototype service with quick turnaround
- Design support with high-power Thyristor Device Analysis (TDA) software to optimize reliability and efficiency
- Application support, including board layout, simulation and tests
- Global safety standards compliance assistance, including compliance to IEC 61851-1 and IEC66950

**Example:**
AC/DC (Effluent DCDC) with isolating DC/DC Switch Mode Power Supply (SMPS)

**Various Switching Topologies**
- e.g., Full Bridge Converters
- Isolating DC/DC SMPS

**Circuit Protection Device**
- Inductors
- Rectifier Bridge
- Power Factor Correction
- Power Transformers (High Frequency)
- Inductors & Resistors
- Transistors

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**Power Supply Component Guide**

**Bourns Services**
- Analysis, Modeling and Testing

https://www.bourns.com/services/analysis-modeling-and-testing
Bourns® Power Supply Component Guide

**DESIGN CYCLE**

**DEFINE REQUIREMENTS**
- Customer
- Application
- Standards & Regulations
- Power & Rectification

**SELECT & DESIGN COMPONENTS**
- Integrated Circuits, semiconductors, Microcontrollers, MOSFETs, IGBTs, etc.
- Power Conversion Devices, Transformers, Couplers, Diodes, etc.
- Circuit Protection Devices, PTCs, Thyrists, TVS Devices, MOVs, Fuses, GDTs, etc.

**SIMULATE, TEST & PROTOTYPE**

**REVISE & REDEFINE**

**SELECT & DESIGN COMPONENTS**
- Transformer Prototype service with quick turnaround
- Design support with high power Dyra Design Analysis (DyA) software to optimize reliability and efficiency
- Application support, including board layout, simulation and tests
- Global safety standards compliance assistance, including compliance to IEC 61558-1 and EN60079
- Specifying and testing a robust and reliable circuit protection solution for the primary and secondary circuits
- Optimisation of size, weight and efficiency of power supply through an comprehensive component portfolio offering Bourns Analysis, Modelling and Testing

**EXEMPLARY: AC/DC (Soft Switched DC/DC) with Isolated DC Switch Mode Power Supply (SMPS)**

**CIRCUIT PROTECTION DEVICES**

- **INDUCTORS**
  - Various Inductors
- **RECTIFIER BRIDGE**
  - Various Bridge Rectifiers
- **TRANSDUCERS & RESISTORS**
  - Various Snubber Resistors

**POWER SUPPLY TOPOLOGIES**

- Two-Switch Forward Topology
- Half Bridge Forward Topology
- Full Bridge Forward Topology
- Full Bridge Resonant Topology
- Push-Pull Converter Topology
- Boost Converter Topology
- Buck Converter Topology
- Flyback Converter
- Forward Topology

**SECONDARY SIDE ISOLATION**

- Various Switching Topologies (e.g., Full Bridge Converters)
- Isolating DC/DC SMPS

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- Buck Converter Topology
- Flyback Converter
- Forward Topology

**Examples:**

- **Primary Side**
  - Control IC
  - Opto-Coupler
  - Secondary Side Isolation
  - Isolating DC/DC SMPS

- **Example:**
  - SMPS DC/DC
  - e.g., Buck Converters

**Booms offers components for both linear power supplies and switch mode power supplies. Booms’ extensive line of electronic components and custom application solutions meet customer device requirements for high reliability performance in smaller, more compact designs. With continuing miniaturization and packaging innovation, Bourns® circuit protection, circuit conditioning and passive control products deliver the standards-based solutions OEMs can rely on to fulfill ongoing technical demands.**
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### POWER SUPPLY COMPONENTS

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- TransformerPrototype service with quick turnaround
- Design support with high powerFlyway Demon Analysis (FDA) software to optimize reliability and efficiency
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https://www.bourns.com/services/analysis-modeling-and-testing

### DESIGN CYCLE

**DEFINE REQUIREMENTS**

- Customer
- Application
- Standards & Regulations
- Power & Rectification

**SELECT & DESIGN COMPONENTS**

- Integrated Circuits,powerconversion, Microcontroller, MOS, IGBT, FET, FDD, TVS
- Power Conversion
- Switches, Transformers, Diodes, Resistors...
- Circuit Protection
- Diodes, PTC, Thyristors, TVS Devices
- Fixed Resistors, Trimpot®

**SIMULATE, TEST & PROTOTYPE**

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### POWER TRANSFORMERS (High Frequency)

- **Primary Side**
  - DC/DC
  - Push-Pull
  - Full Bridge
  - Half Bridge

- **Secondary Side**
  - Isolated DC/DC
  - TVS, Diode
  - Bridge Rectifiers

### CIRCUIT PROTECTION DEVICES

- **Indicators**
  - Bridge Rectifiers
  - Fast Recovery Diodes

- **Rectifier Bridges**
  - Metal Oxide Varistors
  - TVS Diodes

- **Bi-Directional Bridge**
  - Fuse Protectors

### TRANSISTORS

- **Grit Bipolar Transistors**
  - NPN
  - PNP

- **IGBTs**
  - Insulated Gate Bipolar Transistors

### RECTIFIER DIODES

- **Fast Recovery Diodes**
  - SMD
  - Axial

- **Bridge Rectifiers**
  - Single Phase
  - Three Phase

### CIRCUIT PROTECTION FOCUS

- **Single Swap Resistor**
  - Current Sense

- **Full Bridge**
  - Surge Protection

**REFERENCE GUIDES**

- **Thyristor Surge Protectors**
  - Multifuse®
  - Diode Fuses

- **Non-Isolating SMPS DC/DC**
  - Bridge Converters

- **Isolating DC/DC SMPS**
  - Busfeed Boost Converters

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